Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLIAM DAVID KAPPELE
and
ANNE MARIE PEARSON

Appeal No. 2000-2149
Application No. 08/859,901

ON BRIEF

Before KIMLIN, WALTZ, and LIEBERMAN, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of the examiner refusing to allow claims 1, 3, 8 through 10, 20, 29 and 32 through 34. Claims 2, 4 through 6, 17, 25 through 28, 30 and 31 have previously been allowed. Claims 12 through 16 and 21 through 24 previously rejected have been indicated as allowable in the Answer. See Answer, page 2. Claims 7, 11, 18 and 19 have been canceled.

THE INVENTION

The invention is directed to an aqueous ink composition comprising a co-solvent mixture of from about 5.0% to about 30.0% of a C_2-C_8 terminal alkanediol and a second solvent selected from a group of solvents including polyethylene glycol. Each of the solvents is present in a weight ratio of 5:95 to 95:5. Furthermore, the claimed subject matter contains a proviso that when ethylene glycol is present, as the C_2 - C_8 terminal alkanediol, the second solvent may not be polyethylene glycol. Additional limitations are provided in the following illustrative claims.

THE CLAIMS

Claims 1, 20, and 32 are illustrative of appellants' invention and are reproduced below.

1. An aqueous ink composition suitable for use in ink jet printers comprising:

   (a) from about 0.1% to about 20.0% by weight of a colorant;

   (b) from about 0.001% to about 40.0% by weight of a polymeric dispersant for said colorant;

   (c) from about 40.0% to about 80.0% by weight of an aqueous carrier; and

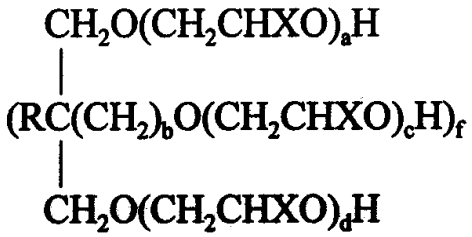
   (d) from about 5.0% to about 30.0% by weight of a cosolvent mixture comprising:

      (1) C_2-C_8 terminal alkanediol or a mixture thereof; and

(2) a material selected from the group consisting of:

(i) polyethylene glycols, and mixed poly(ethylene) (propylene) glycols, having a molecular weight of from about 200 to about 5,000;

(ii) a polyol/polyalkylene oxide condensate having the formula



wherein X is a H or C_1-C_6 alkyl, R is H, C_1-C_6 alkyl or $CH_2O(CH_2CH_2O)_eH$, b is 0 or 1, a+d+f(c+ e) is from about 2 to about 100, and f is from about 1 to about 6; and

(iii) mixtures thereof;

wherein the weight ratio (1):(2) is from about 95:5 to about 5:95 and further wherein when the C_2-C_8 terminal alkanediol comprises a C_2 terminal alkanediol, component (d)(2) does not consist of polyethylene glycol.

20. An aqueous ink composition according to claim 1, wherein the ink composition has an optical density of at least about 1.35 and displays good maintenance and print characteristics.

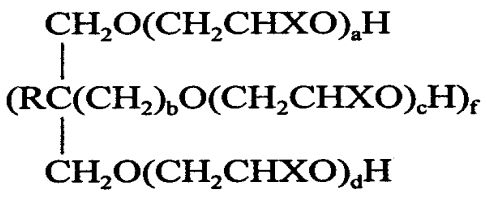
32. An aqueous ink composition according to claim 1, wherein the cosolvent mixture comprises:

(1) C_2-C_8 terminal alkanediol selected from the group consisting of 1,3-propanediol, 1,4-butanediol, 1,6-hexanediol, 1,7-heptanediol and mixtures thereof; and

(2) a material selected from the group consisting of:

(i) mixed poly(ethylene)(propylene) glycols having a molecular weight of from about 200 to about 5,000;

(ii) a polyol/polyalkylene oxide condensate having the formula



wherein X is H or C_1-C_6 alkyl, R is H, C_1-C_6 alkyl or $CH_2O(CH_2CH_2O)_eH$, b is 0 or 1, a+d+f(c+e) is from about 2 to about 100, and f is from about 1 to about 6; and

(iii) mixtures thereof.

THE REFERENCES OF RECORD

As evidence of obviousness the examiner relies upon the following references:

Shimizu et al. (Shimizu)	5,607,999	Mar. 4, 1997
Imagawa	5,677,363	Oct. 14, 1997

THE REJECTION

Claims 1, 3, 8 through 10, 20, 29 and 32 through 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimizu or Imagawa.[1]

[1]The rejection of claims 1, 3, 8 through 10, 12 through 16, 20 through 24, 29 and 32 through 34 under 35 U.S.C. § 112, second paragraph has been withdrawn by the examiner. See Answer, page 2.

OPINION

We have carefully considered all of the arguments advanced by the appellants and the examiner, and agree with the examiner that the rejection on the grounds of obviousness is well founded with the exception of claim 32.

As an initial matter the appellants have stated that, "claims 1, 3, 8-10, 29 and 33 stand or fall together." See Brief, page 10. Claims 20, 32, and 33 are independently patentable from claim 1. We note the conflict in the above statement regarding claim 33. However, inasmuch as appellants have presented separate arguments for each of claims 20, 32, and 33, we select claim 1, the sole independent claim and dependent claims 20, 32 and 33 as representative of the claimed subject matter and limit our consideration thereto. See 37 CFR § 1.192(c)(7) (1999).

Rejection under 35 U.S.C. § 103 over Shimizu

Shimizu is directed to a water-based ink comprising water, a pigment, a water soluble homopolymer and a copolymer having a hydrophobic and hydrophilic portion. See column 1, lines 40-48. There is no dispute that these components correspond to elements (a), (b) and (c) of the claimed subject matter. The issue before us is whether Shimizu discloses component (d) the co-solvent mixture of the claimed subject matter.

We find that Shimizu discloses a preferred embodiment wherein a high boiling low volatile solvent and a monohydric alcohol are incorporated into the ink. See column 5, lines 5-8. We find that the amount of high boiling low volatile solvent is present in an

amount of 0.45 to 20% by weight. See column 5, lines 39-40. We conclude that this amount overlaps that of the claimed subject matter, i.e., "about 5.0% to about 30.0% by weight." We find that the solvents disclosed include ethylene glycol, propylene glycol, 1,5-pentanediol and polyethylene glycol among a limited number of high boiling low volatile solvents. See column 5, lines 27-38. We further find a more limited group of solvents including ethylene glycol, propylene glycol and polyethylene glycol among a limited group of six solvents as disclosed in claim 7 and a still more limited group of high boiling low volatile solvents including only glycerin, ethylene glycol, propylene glycol and polyethylene glycol as disclosed in claim 23. We further find that Example 6 discloses a 1:1 weight ratio of ethylene glycol and polyethylene glycol (#200). We conclude that the molecular weight of the polyethylene glycol is 200, the low molecular weight being consistent with the utilization of the polyethylene glycol as a solvent. We further conclude therefrom that a combination of solvents in a 1:1 ratio is contemplated within the scope of Shimizu. Furthermore, we conclude that it would have been obvious to have substituted propylene glycol generally and 1,3-propanediol specifically for ethylene glycol particularly in view of the limited preferred requirement of four solvents disclosed in claim 23 and the fact that 1,3-propanediol constitutes the next higher homolog of ethylene glycol, i.e., 1,2-ethanediol. Furthermore, the specific disclosure of 1,5-pentanediol suggests that Shimizu prefers the utilization of the α, ω-alkanediols. See column 5, line 31.

We conclude that the combination of solvents, the ratios, and the proportions set forth in the claimed subject matter could have been readily obtained by one of ordinary skill in the art, particularly in view of the teachings of Shimizu supra, and as such are result effective variables. It is well settled that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. See In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980); In re Antonie, 559 F.2d 618, 620, 195 USPQ 6, 8-9 (CCPA 1977); and In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Based upon the above findings and analysis, we conclude that the Shimizu reference of record is sufficient to establish a prima facie case of obviousness with respect to claim 1.

As to claim 20 directed to the characteristics of the ink, it is well settled that when appellants' product and that of the prior art appear to be identical or substantially identical, the burden shifts to appellants to provide evidence that the prior art product does not necessarily or inherently possess the relied-upon characteristics of appellants' claimed product. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 597 (CCPA 1980); In re Best, 562 F.2d 1252, 1254-55, 195 USPQ 430, 433-34 (CCPA 1977). Furthermore, the discovery of a new property even when that property is unobvious from the prior art, cannot impart patentability to claims directed to a known composition. In re

Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990). Based upon the above findings of fact and analysis, we conclude that the Shimizu reference of record is sufficient to establish a prima facie case of obviousness with respect to claim 20.

We shall also affirm the rejection of claim 33 directed to a solvent combination of 1,3-propanediol and polyethylene glycol. We find that the disclosure of propylene glycol suggests the utilization of 1,3-propanediol, the only other species possible being 1,2-propanediol. Furthermore, as we previously found, the specific disclosure of 1,5-pentanediol suggests that Shimizu prefers the utilization of the α, ω-alkanediols. See column 5, line 31 and our discussion supra. We accordingly conclude that a prima facie case of obviousness has been established with respect to claim 33.

However, as to claim 32, solvent (i), we construe the scope of this solvent as being directed to a copolymer of ethylene and propylene glycol. We find no evidence on the record before us to suggest the presence of components falling within the scope of either (i) or (ii). Accordingly, we reverse the rejection of claim 32.

Based upon the above findings and analysis, we conclude that the examiner has established a prima facie case of obviousness with respect to each of the rejected claims other than 32.

Rejection under 35 U.S.C. § 103 over Imagawa

Imagawa is directed to a water-based ink composition comprising water, a coloring agent and a polymeric dispersant. See column 1, lines 60-64, and column 2, lines 4-6.

The ink composition likewise may contain a water-soluble polyhydric alcohol including among a limited number of examples (seven), ethylene glycol, propylene glycol and polyethylene glycol having a molecular weight of 200-600. See column 5, lines 8-21. The polyhydric alcohols may be present in an amount of not more than 20% by weight. See column 5, lines 16-17. There are no examples directed to a mixture of solvents. Nonetheless, we find that polyethylene glycol is utilized in composition 5, column 7, in an amount of 2.0%, Ink composition 3, column 9, in an amount of 3%, and Ink composition 5, column 10, in an amount of 2%.

It is well settled, however, that it is a matter of obviousness for one of ordinary skill in the art to combine two or more materials when each is taught by the prior art to be useful for the same purpose. In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). Here, appellants have simply combined two well known solvents each utilized in ink compositions to perform the same function. Accordingly, we conclude that it would have been obvious for one of ordinary skill in the art to combine propylene glycol in the form of 1,3-propanediol with polyethylene glycol.

We otherwise adopt our analysis supra with respect to the ratios and proportions of solvents, and our position with respect to claims 20, 32, and 33.

As rebuttal to the prima facie case of obviousness established by the examiner, the appellants have presented allegedly unexpected results. See Brief, page 18. They rely on Examples 1-11 of the specification and the conclusions reached therefrom that each of the

examples has an average optical density of at least 1.35. Having reviewed the data present, we conclude that appellants have not met their burden of showing unexpected results. In re Klosak, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972). It is not sufficient to assert that the results obtained are unusual or unexpected. The burden of showing unexpected results rests on those who assert them. We find that no explanation has been proffered by the appellants. We find neither an adequate explanation in the Reply Brief as to the meaning of the data presented, nor an explanation as to how the data presented reasonably leads one of ordinary skill in the art to a conclusion that rebuts the prima facie case of obviousness established by the examiner.

Each of the examples presented by the appellants are inventive examples. Most of the examples are directed to combinations of low molecular weight polyethylene glycol and 1,3-propanediol. In comparison, the closest prior art is a combination of 1,2-ethanediol, the next lower homolog and low molecular weight polyethylene glycol as disclosed by Shimizu. There is however, no comparison with the Shimizu example. Accordingly, to the extent that appellants have presented data within the scope of their invention, the showing of unexpected properties in the specification is ineffective and not persuasive because appellants have not presented a comparison with the closest prior art. In re Baxter Travenol Labs., 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991); In re De Blauwe, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984).

In addition, we conclude that the showing in the Examples is not commensurate in

scope with the degree of protection sought by the claimed subject matter. See In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 778 (Fed. Cir. 1983); In re Tiffin, 448 F.2d 791, 792, 171 USPQ 294, 294 (CCPA 1971). It is well settled that "objective evidence of nonobviousness must be commensurate in scope with the claims," see In re Lindner, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972); In re Dill, 604 F.2d 1356, 1361, 202 USPQ 805, 808 (CCPA 1979)("The evidence presented to rebut a prima facie case of obviousness must be commensurate in scope with the claims to which it pertains.") There is no comparative data present in the specification. Moreover, as to the data presented, the examples are largely directed to a solvent mixture of 1,3-propanediol and polyethylene glycol or a mixture of Liponic EG-1 which is the 26 mole ethylene oxide adduct of glycerine. In comparison, the claimed subject matter is also directed to mixed poly(ethylene)(propylene) glycol and a diverse group of oxyalkylated component (ii) of which only a single species of each has been exemplified by the appellant. In addition, except for Example 2, the ratio of the solvents in each example is 1:1. In Example 2 the ratio is 2.33 :1. In contrast, the claimed subject matter requires a ratio of 95:5 to 5:95. Based upon the above findings, we conclude that to the extent that there is a showing, it is not commensurate with the claimed subject matter.

Based upon the above reasons, and those set forth in the answer, we have determined that the examiner has established a prima facie case of obviousness. Upon reconsideration of all the evidence and arguments submitted by appellants, we have determined from the totality of the record that the preponderance of the evidence weighs in favor of obviousness within the meaning of 35 U.S.C. § 103. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

DECISION

The rejection of claims 1, 3, 8 through 10, 20, 29 and 33 through 34 under 35 U.S.C. § 103(a) as being unpatentable over Shimizu or Imagawa is affirmed.

The rejection of claim 32 under 35 U.S.C. § 103(a) as being unpatentable over Shimizu or Imagawa is reversed.

The decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

THOMAS A. WALTZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
PAUL LIEBERMAN Administrative Patent Judge	)	

KIMLIN, ADMINISTRATIVE PATENT JUDGE, DISSENTING:

I respectfully disagree with my colleagues regarding the reversal of the examiner's rejection of claim 32 under 35 U.S.C. § 103.

Claim 32 recites, inter alia, "mixed poly(ethylene)(propylene)glycols." The specification does not provide any guidance concerning the meaning of the claim language. Therefore, since claim language must be given the broadest reasonable interpretation consistent with the specification during ex parte prosecution, I cannot agree with the majority that the claim language should be interpreted as "a copolymer of ethylene and propylene glycol" (p. 8 of decision, 2nd paragraph). In my view, absent any definition in the specification, the language is sufficiently broad to embrace a mixture of ethylene glycol and propylene glycol, as well as the copolymer of the two monomers. Since both references teach the use of ethylene glycol and propylene glycol, it would have been obvious for one of ordinary skill lin the art to use a mixture of the glycols as a solvent. In re Kerkhoven, supra.

Moreover, even accepting the majority 's interpretation of the claim language, I find a close similarity in chemical structure between a copolymer of ethylene glycol and propylene glycol and polyethylene glycol and polypropylene glycol. Accordingly, since each of ethylene glycol, propylene glycol, polyethylene glycol and polypropylene glycol was known in the art as a suitable solvent, I am convinced that one of ordinary skill in the art

would have reasonably expected the copolymer of ethylene glycol and propylene glycol to act as an effective solvent. The prima facie case of obviousness arises from the reasonable expectation that compounds that are similar in chemical structure will exhibit similar properties. In re Hoch, 428 F.2d 1341, 1343-44, 166 USPQ 406, 409 (CCPA 1970).

Based on the foregoing, I would also affirm the examiner's rejections of claim 32 under 35 U.S.C. § 103.

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